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**The tunica adventitia of human arteries and veins as a source of mesenchymal stem cells.**

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**Public Summary:**

We previously demonstrated that human pericytes, which encircle capillaries and microvessels, give rise in culture to genuine mesenchymal stem cells (MSCs). This raised the question as to whether all MSC are derived from pericytes. Pericytes and other cells defined on differential expression of CD34, CD31, and CD146 were sorted from the stromal vascular fraction of human white adipose tissue. Besides pericytes, CD34<sup>+</sup> CD31<sup>-</sup> CD146<sup>-</sup> CD45<sup>-</sup> cells, which reside in the outmost layer of blood vessels, the tunica adventitia, natively expressed MSC markers and gave rise in culture to clonogenic multipotent progenitors identical to standard bone marrow-derived MSC. Despite common MSC features and developmental properties, adventitial cells and pericytes retain distinct phenotypes and genotypes through culture. However, in the presence of growth factors involved in vascular remodeling, adventitial cells acquire a pericytes-like phenotype. In conclusion, we demonstrate the co-existence of 2 separate perivascular MSC progenitors: pericytes in capillaries and microvessels and adventitial cells around larger vessels.

**Scientific Abstract:**

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